Lindsay Cheng

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Education

University of Toronto St. George — Toronto, ON
*BASc Chemical Engineering + **PEY Co-op** | **3.90/4.0 cGPA*** — *Expected April 2030*
Awards & Honors: First Year Summer Research Fellowship (2025)

Experience

University of Toronto Aerospace Team (UTAT) - Space Systems — Sep 2025 – Present
Software Developer, Attitude Determination & Control Systems (ADCS) — *Toronto, ON*

- Built **Python** control system for on **Linux** for Helmholtz cage satellite ground testing
- Implemented **7-component orbital simulation pipeline** with **SGP4 propagation** to generate 3D magnetic field vectors for **hardware-in-the-loop** testing
- Led troubleshooting and post-test debugging by developing an **automated logging infrastructure** tracking 10+ telemetry parameters

Green Technologies Lab (University of Toronto) — May 2025 – Aug 2025
Materials Science Engineering Research Intern — *Toronto, ON*

- Improved **Phase Change Material (PCM)** thermal conductivity by **10%** for EV battery applications using novel biochar composites
- Developed **calcium-catalyzed pyrolysis** process achieving **10% faster thermal response** at 200°C lower processing temperature
- Automated **Raman spectroscopy** analysis using **Python**, processing 100+ biochar samples and reducing manual analysis time by **80%**

Projects

ClearMark | *Swift, Node.js, Express, PostgreSQL, Google OAuth* | *Link*

- Built a **full-stack** role-based **AI grading** and **course management** iOS app in **Swift** using **VisionKit** for document scanning and **Gemini API** for rubric-aligned evaluation
- Designed **MVVM** architecture and **PostgreSQL** schema supporting courses, assignments, and grading rubrics with role-based access control across instructors, TAs, and students
- Deployed **Node.js/Express** backend on Render with **Google OAuth 2.0**, **RESTful API**, and **Cloudflare R2**

Water Bottle Defect Detection System | *Python, YOLOv8, OpenCV, SQLite, Tkinter* | *Link*

- Built automated quality control system using **YOLOv8 + OpenCV**, with a **Tkinter** monitoring dashboard
- Collected and annotated **300+ images** across 4 defect classes to train and validate a **YOLOv8n** model over 100 epochs, achieving **95.9% mAP@50-95**
- Used **ByteTrack** to implement per-bottle ID assignment and multi-object tracking with **SQLite** defect logging

Reversi Game Bot | *C* | *Link*

- Implemented **minimax** engine with **alpha-beta pruning** in **C**, achieving 800ms move decisions at **7-ply depth**
- Designed heuristic evaluation with **position weighting** and **mobility analysis**, improving win rate by **20%** over the baseline model

Send | *Swift, YOLOv8, OpenCV, FastAPI, MongoDB* | *Link*

- Built social bouldering iOS app integrating **YOLOv8** hold detection and pathfinding algorithm, processing wall images in under **2 seconds**
- Deployed **FastAPI** backend with **ArUco marker** calibration for accurate camera-to-wall coordinate mapping

Skills

Languages: Python, C/C++, Swift, MATLAB, JavaScript, TypeScript, HTML, CSS
Technologies: React, Node.js, Express, PostgreSQL, FastAPI, MongoDB, SQLite, Ultralytics, OpenCV, PyTorch
Tools & Platforms: Git, GitHub, Render, Postman, Excel, Render, Cloudflare R2, Roboflow, Linux
Concepts: Version Control, Data Structures, Microservices, SDLC, User Requirements Analysis
Focus Areas: Computer Vision, Mobile App Development, Machine Learning, Quality Assurance